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Issues in Management, Risk Assessment and Mitigation

It was a soft start but then we ramped up after coffee……

- Defining Impacts
- Shipping
- Risk Assessment
- Models

Defining Impacts

- Episodic
  - Seismic
  - Sonar
  - Construction
- Continuous
  - Shipping
  - Pipelines

Shipping

- We discussed shipping and came to the conclusion that the technology is already available to make ships quieter
- We need to gain national and international will to move this issue forward and develop means of implementation, such as using domestic jurisdiction over ports/internal waters
- Other mitigation for shipping may include routing shipping lanes away from critical habitats

Risk Assessment

- Can risk assessment work out the significance of an effect?
- Is it better to have a risk assessment with many limitations and qualifications or no risk assessment at all?
- Decision makers work upon the best available information – A decision has to be made!
- Risk assessment is project specific so resource intensive

Risk Assessment – Best Practice

- Precaution should be built into the risk assessment
- Risk assessment should be part of the design process not something that happens once a project is completed
- We should find a common standard for risk assessment – a common language

Models

What models do we use at the moment?

- Acoustic Integration Model (AIM) and Effects of Sound on Marine Environment (ESME – currently a research project)
  - Designed for 1 or 2 sources of sound in a small defined area with a small number of animals
- Risk Matrix
  - Looking at probability of event happening and the likely consequence of that event
  - Simple tool compared to other modelling techniques

Models

- Predictive Location Abundance Modelling
  - Relies on using bathymetry and other oceanographic data
- Environmental Risk Management Capability (ERMC) and PMAP
  - Real time ship board systems
- NURC Model

Limits of Models

- Quantitative vs. Qualitative
- Models are limited by quality of data that goes in and our assessment of the uncertainties
- Models are tools for the decision maker – the decision maker needs to be aware of the limits or uncertainties so that they can make an informed decision

Different Views on Models

- Do you need the data first then design the model or model first and then get the data?
- Models best used for ruling out things that are unlikely to happen but still difficulties with using models for predictive purposes
- Bayesian Frameworks offer the potential to make significant improvements

Management – Best Practice

- What is the goal of management – no harm to an individual marine mammal or is there an effect that is acceptable? Tolerance of risk is subjective and cultural.
- Are we concerned about effects on individual or population level effects – do we understand the link between the two?
- Good management should consider cumulative, synergistic and long term (over time) effects

Mitigation – Best Practice

- As Jay described we do not know the effectiveness of many current mitigation techniques…… but these are based on common sense
- Seasonal / Geographical restriction were thought to be the best mitigation tool for species where critical habitats can be identified
- To decide what mitigation measures you need, a decision should be made as to what the management aim is
- There's significant potential for mitigation that modifies the source to minimize noise produced
- We should work towards better quantifying the unknowns in terms of mitigation and whether it is effective.

Mitigation - Future

- Some thought great potential for active broad band sound to be used to distinguish between targets – but you have to ensure that mitigation technique does not add to the problem (i.e. more noise in environment)
- More consideration of source based mitigation
- Military can and are developing passive techniques; however these can not be used for targeting….. So there will always be a need for active sonar
- While no one solution, move towards standard approaches for mitigation for seasonal restrictions and current mitigation (i.e.Industry potential from current philosophies)

Risk Assessment – The Ideal Future……..

- Gaining sufficient Data / Knowledge of
  - Population Baselines
  - Distribution
  - Sound Sources, noise / transmission models
  - How sound impacts on marine mammals (behaviour when feeding / breeding etc.)
  - How to translate individual level effects to populations
  - Ability to take into account natural changes
- …but this may not be achievable……

Future Management

- Dealing with Transparency
- No one system will work for all industries
- Encouraging active participation from all stakeholders, particularly national govts. Where no such participation currently exists.

Erin kicked us out!